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ABSTRACT

This evaluation provides an overview of demographic characteristics and student achievement outcomes among Wake Country Public School System (WCPSS) elementary schools when these schools are categorized as schools of choice (program magnets and calendar magnets) or traditional schools (nonmagnets). Data were drawn from school-level outcomes reported in the "2000-2001 Wake County School Profiles." Central to the study is the conclusion that there are no significant differences in schools' ABCs Performance Composites (composites from the state's ABCs accountability program) when they are statistically adjusted to equalize differences in race and socioeconomic status. Through the WCPSS magnet program, families can take advantage of opportunities for school choice without sacrificing the level of academic performance their students can expect to achieve. The school system also benefits because magnet schools promote diversity and help optimize the use of facilities throughout the system. (Author/SLD)

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Eye on Evaluation

Evaluation and Research Department

May 2001 E&R Report No. 01.27

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WAKE COUNTY PUBLIC SCHOOL SYSTEM

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Comparing Student Performance at Program Magnet, Year-Round Magnet, and Non-Magnet Elementary Schools

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ABSTRACT

This evaluation provides an overview of demographic characteristics and student achievement outcomes among Wake County Public School System elementary schools, when these schools are categorized as schools of choice (program magnets and calendar magnets) or traditional schools (non-magnets). Data were drawn from school-level outcomes reported in the 2000-2001 Wake County School Profiles.

Central to the study is the conclusion that there are no significant differences in schools' ABCs Performance Composites when they are statistically adjusted to equalize differences in race and socioeconomic status. Through the WCPSS Magnet Program, families can take advantage of opportunities for school choice without sacrificing the level of academic performance their students can expect to achieve. The school system also benefits because magnet schools promote diversity and help to optimize the use of facilities throughout the system.

SCHOOLS OF CHOICE IN WCPSS

The Wake County Public School System (WCPSS) Magnet Program originated in 1982-83 with the creation of 28 magnet schools under the system's "Schools of Choice" plan. As Wake County's population has increased since that time, so has the number of magnet schools. In 2000-01, 43 magnet schools operate in WCPSS — 30 elementary magnets, 10 middle schools, and 3 magnet high schools. As stated below in its guiding principles, the Magnet Program is designed to assist WCPSS in attaining the following objectives.

- **Utilization of Schools** — optimal use of facilities.
- **Equity of Educational Opportunity** — accommodate growth and changing demographics in Wake County; make unique programs accessible to all students; discover and develop individual student's gifts and talents.

- **Diverse Student Population** — promote positive character traits; respect other cultures and beliefs; enrich learning experiences and achievement; provide learning opportunities for students considering socioeconomic status and achievement,
- **Program Involvement** — attract and retain high-quality personnel; raise standards for the entire district; continue to search for excellent and innovative programs that meet the needs of all students, and
- **Parental Participation and Choice** — increase parental participation by providing opportunities for choice; provide a wide selection of top-quality programs.

Magnet Themes

Magnet themes offered in the original Schools of Choice plan were classical studies; international studies; gifted and talented; and extended day. Since then, the number of themes from which parents and students can choose has expanded to include the original options* as well as creative arts and science; the community model; university connections; global communications; international baccalaureate; language explorations; leadership; Montessori; math, science, and technology; and visual and performing arts.

Year-Round Schools

In response to a burgeoning student population, WCPSS added year-round schools as a magnet option in 1989-90. There are presently nine year-round elementary schools and three year-round middle schools. Like other magnets, year-round schools are schools of choice; however, at these schools parents and students choose a calendar versus a magnet theme. The year-round calendar, which schedules four cohorts of students sequentially throughout the year, allows these schools to accommodate up to 33% percent more students.

DESIGN OF THIS STUDY

Designed to examine the differences, if any, in demographic patterns and student achievement at magnet and non-magnet schools in WCPSS, this study focuses on elementary schools and will be followed by a similar study of middle schools. It addresses two main evaluation questions:

- Do student population characteristics differ at magnet and traditional elementary schools in WCPSS?
- Does academic achievement differ at magnet and traditional elementary schools in WCPSS?

Additionally, survey responses reflecting parents' opinions of the quality of educational programs at magnet and traditional schools are compared.

*As of the 2001-02 school year, extended day will no longer be a formal magnet theme offering because before- and after-school programs have become available at many magnet and non-magnet schools.

Elementary School Categories

Schools were divided into three categories for this study. Elementary schools offering specific magnet themes were categorized as *program magnets* and year-round elementary schools were categorized as *calendar magnets*. These two magnet categories were compared to each other and to all other elementary schools in the system, which were categorized as *non-magnet* schools. Based on this categorization, the study includes

- 21 program magnets,
- 9 calendar magnets, and
- 44 non-magnets.

Data Source

Each year the WCPSS Evaluation and Research Department publishes school profiles that describe student population characteristics, test results, and survey responses for every school in the system. The information from the 2000-2001 Wake County School Profiles used in this analysis included schools' September 2000 demographic characteristics and their May 2000 results from North Carolina's accountability program, the ABCs of Public Education. The study also looked at the WCPSS Effectiveness Index and selected parent survey results from the profiles.

Methodology

Because the school profiles provide summary data for schools, rather than for individual students, the study was based on school-level information. In the initial phase of the analysis, data for demographic and achievement variables were summed or averaged across all elementary schools in each category — non-magnets, program magnets, and calendar magnets. The evaluator then developed a series of tables and figures to chart and review similarities and differences among the categories. This was followed by non-parametric and parametric analysis procedures to determine which differences were statistically significant. Analysis of covariance was then used to adjust student performance results to account for disparities in race and socioeconomic status at calendar magnets, program magnets, and non-magnet elementary schools.

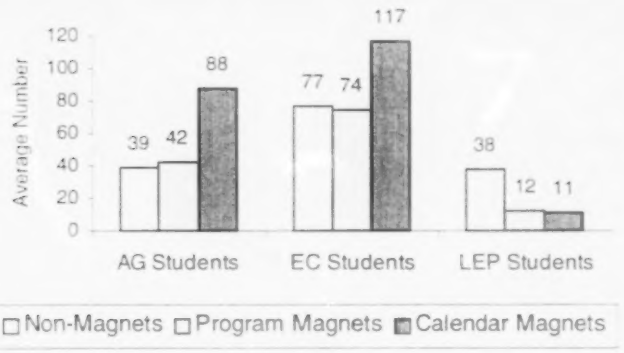
The school demographic characteristics considered in this study are special populations, student mobility, race, and socioeconomic status (percent of students eligible for free or reduced-price lunch, i.e., FRL). These are charted and discussed in the paragraphs below. Then Growth and Performance Composites from the state ABCs of Public Education are reviewed to compare student achievement across the three categories of schools. The WCPSS Effectiveness Index, based on End-of-Grade Reading and Mathematics test scores, is examined. Finally, districtwide parent survey results are presented.

DEMOGRAPHICS

Special Student Populations

Based on figures in the school profiles, differences exist in the numbers of special populations students at program magnets, calendar magnets and non-magnet schools (Figure 1). The average number of academically gifted (AG) and exceptional students (EC, excluding AG) tends to be quite a bit higher at calendar magnets than at non-magnets or program magnets. The number of students with limited English proficiency (LEP) is higher at non-magnet schools.

Figure 1. Average Number of Special Populations Students at Non-Magnet, Program Magnet, and Calendar Magnet Elementary Schools



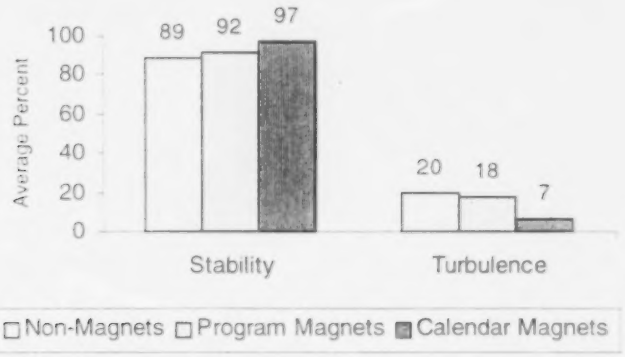
Student Mobility

The school profiles use two measures to determine student mobility — stability and turbulence.

- High stability, the percentage of students continuously enrolled in a school from the beginning to the end of the school year, indicates low mobility.
- Low turbulence, the movement of students in and out of the school, also indicates low mobility.

The combination of high stability and low turbulence suggests that a school's student population has been consistent throughout the year, i.e., mobility has been low. The higher average stability and lower average turbulence of calendar magnets point toward a somewhat more stable student population at these schools than at program magnets and non-magnets (Figure 2).

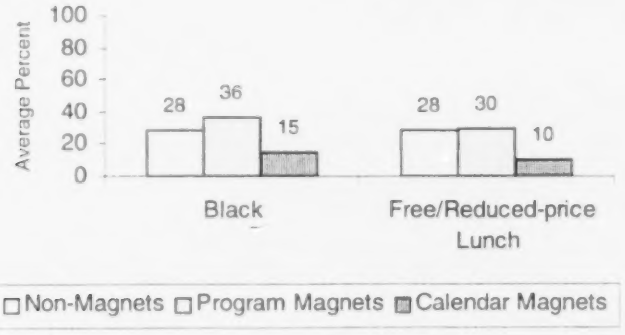
Figure 2. Student Mobility (Average Percent Stability and Turbulence) at Non-Magnet, Program Magnet, and Calendar Magnet Elementary Schools



Race and Free or Reduced-Price Lunch

Comparison of the percentages of Black students and students receiving free or reduced-price lunches suggests that these groups comprise a much smaller proportion of the student population at calendar magnets than at program magnets or non-magnet elementary schools (Figure 3). A Kruskal-Wallis test confirmed this difference for race (X^2=13.17, p=.0014) and FRL (X^2=15.65, p=.0004). Multiple comparison procedures showed that the differences in demographics between calendar magnets and program magnets as well as between calendar magnets and non-magnet schools were statistically significant. The demographic differences between program magnets and non-magnets, however, were not great enough to be statistically significant.

Figure 3. Average Percent of Black and FRL Students at Non-Magnet, Program Magnet, and Calendar Magnet Elementary Schools



STUDENT ACHIEVEMENT

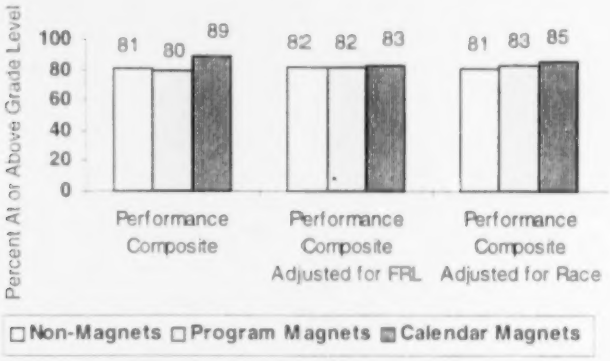
The ABCs of Public Education

Based on the 1999-2000 state End-of-Grade (EOG) Reading and Mathematics tests and the 4th grade writing assessment, the North Carolina ABCs accountability program calculated a Performance Composite and a Growth Composite for every elementary school in the state. EOG tests and writing assessments are administered to individual students; however, scores are grouped by school to determine each school's ABCs results. The WCPSS school profiles list each school's ABCs Performance Composite and report whether or not a school's Growth Composite met or exceeded expectations.

ABCs Performance Composite. A school's Performance Composite denotes the percentage of EOG tests and writing assessments given at that school on which students scored at or above grade level. A comparison of ABCs Performance Composites for non-magnets, program magnets, and calendar magnet elementary schools shows that the average Performance Composite for calendar magnets exceeds composites of both program magnet schools and non-magnets. (See Figure 4, first three bars; F=6.07, p=0.0037. These bars represent Performance Composites not adjusted for demographic differences among school categories.)

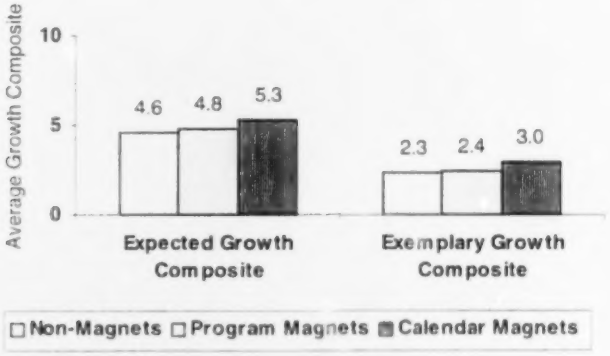
As noted earlier, the average percentage of Black students and students eligible for free or reduced-price lunch was significantly higher at program magnets and non-magnets than at calendar magnets. Because performance can be affected by the ethnicity pattern or socioeconomic status of a school, an analysis of covariance procedure was used to statistically adjust the average Performance Composite of each school category so that differences in race or FRL were equalized. *When the Performance Composites adjusted for FRL are compared (Figure 4, second three bars), no statistically significant differences are seen (F=0.09, p=0.92). Similarly, when performance is adjusted for race (Figure 4, third set of bars), the differences among school categories are not statistically significant (F=1.85, p=0.17).* This demonstrates that, if the percentages of Black students or students eligible for free or reduced-price lunch were similar at non-magnet, program magnet, and calendar magnet elementary schools, the average Performance Composites would also be similar for the three categories of schools.

Figure 4. Performance Composites (Percent At or Above Grade Level) for Non-Magnet, Program Magnet, and Calendar Magnet Elementary Schools



ABCs Growth Composite. The state ABCs system also calculates and reports a Growth Composite for each school. Based on End-or-Grade Reading and Mathematics test scores, a school's expected growth is the average amount of growth in student achievement that the state anticipates annually for one year's worth of instruction. The exemplary growth level is 10% beyond expected growth. The amount of growth expected by the state is subtracted from the amount of growth a school actually achieves. Thus, a school that attains or surpasses growth expectations will have a Growth Composite of zero or greater. Figure 5 displays the average expected and exemplary Growth Composites for non-magnets, program magnets, and calendar magnets in WCPSS. Expected and exemplary Growth Composites are well above zero because all of the school categories in this study exceeded the state's growth expectations. *Any differences in the average expected or exemplary Growth Composites among the three categories were not large enough to be statistically significant. (Expected Growth, F=0.19, p=0.83; Exemplary Growth, F=0.17, p=0.84).* If schools' Growth Composites had been adjusted for demographic differences, the Expected and Exemplary Growth averages across categories would have been even more similar.

Figure 5. Average Expected and Exemplary Growth Composites for Non-Magnet, Program Magnet, and Calendar Magnet Elementary Schools



WCPSS Effectiveness Index

To supplement information from the state ABCs accountability program, WCPSS also uses its own Effectiveness Index to compare schools within the system. The index, calculated by grade level for both reading and mathematics, takes into account previous test performance as well as the socioeconomic and special education status of students in a school. If a school's Effectiveness Index is similar to 75-80% of other schools, it is classified as "Effective." Schools with indexes significantly lower or higher than other schools are classified as "Below" or "Above." The percentage of program magnet, calendar magnet, and non-magnet schools classified as "Effective" or "Above" is shown in Figures 6 (Reading) and 7 (Math). Although this study did not include formal statistical tests of these variables, Figures 6 and 7 demonstrate that, at most grade levels, the Effectiveness Indexes for all three school categories are relatively similar for both reading and mathematics, even without adjusting for demographic differences.

Figure 6. Percent of Non-Magnet, Program Magnet, and Calendar Magnets with Reading Effectiveness Indexes of "Effective" or "Above"

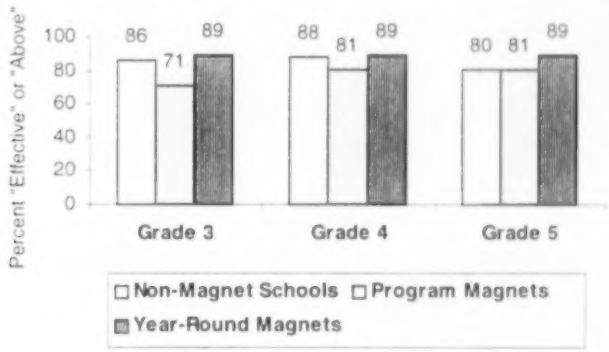
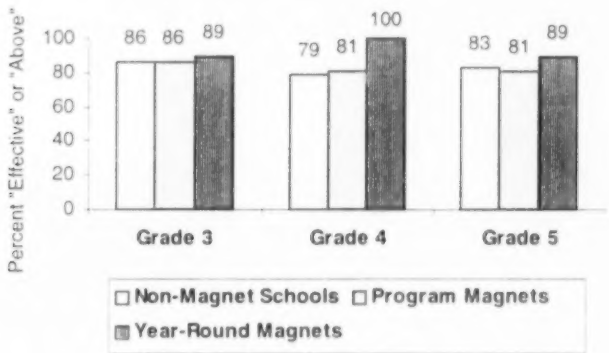


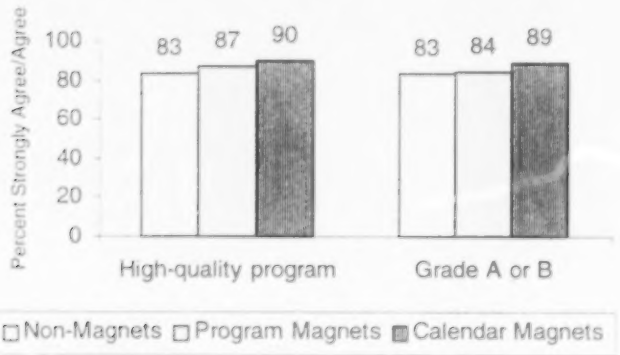
Figure 7. Percent of Non-Magnet, Program Magnet, and Calendar Magnets with Mathematics Effectiveness Indexes of "Effective" or "Above"



Parent Surveys

In addition to demographics and student achievement information, this study also reviewed parent survey results from the school profiles. Based on responses to items on the most recent (1999) districtwide survey, parents' opinions about non-magnets, program magnets, and calendar magnet schools and are positive and fairly similar. Most respondents believe that their child's school has a high-quality educational program, and the majority also give their child's school a grade of A or B (Figure 8).

Figure 8. Parent Survey Ratings of Educational Programs at Non-Magnet, Program Magnet, and Calendar Magnet Elementary Schools



BENEFITS OF PROGRAM MAGNETS

It appears that, in striving to attain the guiding principles of its Magnet Program, WCPSS is offering the benefits of school choice and innovative instruction without sacrificing the level of student achievement at magnet schools. Year-round magnets help the system optimize its use of school facilities and give parents flexible calendar choices, and program magnets offer a rich array of themes to meet the needs of a diverse student population. For example, in a creative arts and science magnet, students explore the arts in all subject-area courses and use their weekly visual arts, music, dance, and theater classes to delve further into core subjects. They also have access to hands-on, discovery-based learning in their science classes. At program magnets with a gifted and talented focus, core academic courses are augmented by a broad array of electives. Students may select as many as 12 electives a year from courses such as architectural design, theater production, comparative mythology, and gymnastics. Based on results from this study, it is apparent that students at program magnets are able to benefit from these unique offerings and still sustain their academic achievement in core areas.